COMBUSTION AND FLAME

THE JOURNAL OF THE COMBUSTION INSTITUTE

VOLUME 77 1989

Contents

Special Issue on Solid Fuel Utilization

DEREK BRADLEY (Leeds, England)
Preface 1
ROBERT H. ESSENHIGH, MAHENDRA K. MISRA, and DAVID W. SHAW (Columbus, OH)
Ignition of Coal Particles: A Review 3
N. EL MEJDOUB and L. DELFOSSE (Villenueve d'Ascq, France)
Elovichian Kinetics During Chemisorption of Oxygen on Semicoke 31
DEREK BRADLEY, G. DIXON-LEWIS, and S. EL-DIN HABIK (Leeds, England)
Lean Flammability Limits and Laminar Burning Velocities of CH_4–Air–Graphite Mixtures and Fine Coal Dusts 41
D. J. BARRATT and P. T. ROBERTS (Chester, England)
The Suitability of Ultrafine Coal as an Industrial Boiler Fuel 51
O. BRANDT and P. ROTH (Duisburg, West Germany)
A Tunable IR-Diode Laser Technique for Measuring Reaction Rates of High-Temperature Aerosols .. 69
R. CHIRONE, P. SALATINO, and L. MASSIMILLA (Naples, Italy)
Secondary Fragmentation of Char Particles During Combustion in a Fluidized Bed 79
J. L. T. AZEVEDO, M. G. CARVALHO, and D. F. G. DURÃO (Lisbon, Portugal)
Mathematical Modeling of Coal-Fired Fluidized Bed Combustors 91

R. J. CATTOLICA, P. K. BARR, and N. N. MANSOUR (Livermore, CA)
Propagation of a Premixed Flame in a Divided-Chamber Combustor 101
ROBERT C. ARMSTRONG and STEPHEN B. MARGOLIS (Livermore, CA)
Hydrodynamic and Reactive/Diffusive Instabilities in a Dynamic Model of Liquid Propellant Combustion. II. Inviscid Fluid Motions 123
RICHARD K. LYON and JERALD A. COLE (Irvine, CA)
Kinetic Modeling of Artifacts in the Measurement of N_2O from Combustion Sources 139
R. D. WILK and N. P. CERNANSKY (Philadelphia, PA) and W. J. PITZ and C. K. WESTBROOK (Livermore, CA)
Propene Oxidation at Low and Intermediate Temperatures: A Detailed Chemical Kinetic Study 145
PATRICK A. MCMURTRY (Salt Lake City, UT) and PEYMAN GIVI (Buffalo, NY)
Direct Numerical Simulations of Mixing and Reactions in a Nonpremixed Homogeneous Turbulent Flow 171
ALAN R. KERSTEIN (Livermore, CA)
Population-Balance Model of Physical Transformations of Ash During Char Oxidation 187
B. DESHAIES and G. JOULIN (Poitiers, France)
Flame-Speed Sensitivity to Temperature Changes and the Deflagration-to-Detonation Transition 201

Brief Communication

M. T. CHENG, M. J. KIRSCH, and T. W. LESTER (Baton Rouge, LA)
Reaction of Nitric Oxide with Bound Carbon at Flame Temperatures 213

J. BUCKMASTER (Urbana, IL)
A Theory for Triple Point Spacing in Overdriven Detonation Waves 219
J. B. GREENBERG (Haifa, Israel)
The Burke–Schumann Diffusion Flame Revisited—With Fuel Spray Injection 229
F. C. GOULDIN (Ithaca, NY), K. N. C. BRAY (Cambridge, England), and
J.-Y. CHEN (Livermore, CA)
Chemical Closure Model for Fractal Flamelets 241
ANITA M. WEINER and STEPHEN J. HARRIS (Warren, MI)
Optical Detection of Large Soot Precursors 261
R. BARBELLA, A. CIAJOLO, A. D'ANNA and C. BERTOLI (Naples, Italy)
Effect of Fuel Aromaticity on Diesel Emissions 267
W. L. FLOWER (Livermore, CA)
Soot Particle Temperatures in Axisymmetric Laminar Ethylene–Air Diffusion Flames at Pressures
up to 0.7 MPa 279
J. MANTZARAS, P. G. FELTON, and F. V. BRACCO (Princeton, NJ)
Fractals and Turbulent Premixed Engine Flames 295
M. SLACK, J. W. COX, A. GRILLO, and R. RYAN (Bethpage, NY) and
O. SMITH (Los Angeles, CA)
Potassium Kinetics in Heavily Seeded Atmospheric Pressure Laminar Methane Flames 311
GAUTAM T. KALGHATGI (Chester, England)
Flame Initiation and Development from Glow Discharges—Effect of Electrode Deposits 321
RANAJIT SAHU, RICHARD C. FLAGAN, and GEORGE R. GAVALAS (Pasadena, CA)
Discrete Simulation of Cenospheric Coal–Char Combustion 337
SUBRATA BHATTACHARJEE and WILLIAM L. GROSSHANDLER (Pullman, WA)
Effect of Radiative Heat Transfer on Combustion Chamber Flows 347
JOHN E. DEC (Ann Arbor, MI) and JAY O. KELLER (Livermore, CA)
Pulse Combustor Tail-Pipe Heat-Transfer Dependence on Frequency, Amplitude, and
Mean Flow Rate 359
JOHN C. KRAMLICH, JERALD A. COLE, JAMES M. McCARTHY, and
Wm. STEVEN LANIER (Irvine, CA) and JOSEPH A. McSORLEY (Triangle Park, NC)
Mechanisms of Nitrous Oxide Formation in Coal Flames 375
ANDREW J. YULE and SATTAR M. AVAL (Manchester, England)
A Technique for Velocity Measurement in Diesel Sprays 385
S. Y. HO, C. W. FONG, and B. L. HAMSHERE (Salisbury, South Australia)
Assessment of the Response of Rocket Propellants to High-Velocity Projectile Impact Using
Small-Scale Laboratory Tests 395

Brief Communications

S. R. TURNS, J. A. LOVETT, and H. J. SOMMER III (University Park, PA)
Visualization of Soot Zones in Turbulent Diffusion Flames 405
STRUAN H. ROBERTSON (Oxford, England)
The Representation of Thermodynamic Functions of Detonation and Combustion Products 411